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10/713,720	11/14/2003	Michael A. Rothman	42P17974	2067

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EXAMINER	
RAHMAN, FAHMIDA	
ART UNIT	**PAPER NUMBER**
2116	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/05/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/713,720	ROTHMAN ET AL.	
	Examiner	Art Unit	
	Fahmida Rahman	2116	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 January 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 November 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This action is in response to communications filed on 7/17/2006.

2. Claims 1, 9, 16 have been amended, no new claims have been added, no claims have been canceled. Therefore, claims 1-20 are pending.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 16, 17, 19, 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dickerson et al (US Patent Application Publication 20030212897).

For claim 16, Dickerson et al teach the following limitations:

A processing system (Fig 1B), **comprising: a processor** (40) **to execute a pre-boot application** ("firmware" mentioned in line 1 of [0028] of page 2), **the processor having a user mode and a kernel mode** (Fig 3B); **a hardware device** (44) **communicatively coupled to the processor; and a data storage unit** (combination of ROM storing the firmware and 46) **communicatively coupled to the processor and having stored thereon a pre-boot environment module** (firmware is stored in ROM) **and a kernel proxy agent** (46 has associated logic stored that can recognize the kernel mode of the processor and enables access to 44), **the pre-boot environment module to be**

executed by the processor to generate an emulated pre-boot environment within the user mode for executing the pre-boot application (ICE provides an emulated pre-boot environment), **the kernel proxy agent to be executed by the processor to provide access to system resources by enabling** (secure areas such as 44 is enabled during supervisor mode. Therefore, user can reach to the secure area. [0037]-[0039] discusses how secure areas are protected. User can access the secure areas but he cannot read the secure areas as data out 84 is blocked by control signal 86 and not available to output port TDO as shown in Fig 5A and 5B. Therefore, access to resource is permitted but reading is not permitted by the secure area obstruction circuit 82) **interaction between the pre-boot application and the hardware device** (46 enables ICE to interact with 44), **wherein the kernel proxy agent comprises a software agent executing on the processor** ([0032] mentions that software interrupt directs the processor core to change mode from user mode to kernel mode. Software interrupt causes software routines to be executed so that microprocessor can change mode and generate the control signals necessary for indicating mode change to 46. Therefore, there must be a software routine executed on the processor that is responsible for generation of control signals for 46. The software routine that drives 46 for enabling kernel mode memory and the logic 46 can be considered together as the kernel proxy agent. In that way, kernel proxy agent comprises a software component executing on the processor).

Although Dickerson does not mention about OS, processor typically use and execute OS for management purpose. Therefore, one ordinary skill in the art would be motivated to execute OS in the processor of Dickerson for better management.

About the limitation, "when the OS does not include an OS user mode application programming interface ("API") for interacting with the hardware device", user mode of processor of Dickerson can't access 44. Therefore, any OS operating on Dickerson's processor can't have user mode API to access 44. The only way to access 44 is through kernel proxy agent.

Although Dickerson provides secure area obstruction circuit to increase security, prior art system did not include any obstruction circuit and allowed the user in supervisor mode to read the secured area ([0033]). Therefore, one ordinary skill would be motivated to access and read the secure area, where security is not a concern, for example, when user is the supervisor. That way, the testing and debugging can be easier.

For claim 17, kernel mode has to reserve memory controller to be used by the supervisor memory.

For claim 19, interface translator is the element that changes the mode of the processor from user mode to kernel or supervisor mode. This provides the request to the kernel

proxy agent, as user mode can't access 44 (hence, there can be no corresponding OS user mode API).

For claims 20, Dickerson does not explicitly mention about the reporting of error occurred during the interaction with the hardware device. Examiner takes an official notice that reporting error is well known in the art. One ordinary skill in the art would be motivated to have an error reporting when interacting with hardware, since ICE is a debug tool for the firmware. If there is any error occurred in accessing the supervisor memory, such error reporting would help the user to take further proper action.

4. Claims 1-14, 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dickerson et al (US Patent Application Publication 20030212897), in view of Linderman (US Patent Application Publication 20040215950).

For claim 1, Dickerson et al teach the following limitations:

A method, comprising: executing a pre-boot application ("firmware" mentioned in line 1 of [0028] of page 2) within an emulated pre-boot environment (10) to test functionality of the pre-boot application (lines 1-2 of [0028] of page 2), the emulated pre-boot environment executing within a user mode of a processor ([0040]) of a processing system; and interacting with a hardware device (44) of the processing system (Fig 1B) in response to the executing of the pre-boot application ([0032] of page 3) via a kernel proxy agent (combination of 46 and its driving routine is the kernel proxy agent, since it

enables 44, which is only enabled in kernel mode) executing in a kernel mode of the processor (supervisor mode is the kernel mode. To access 44, processor 40 should be in kernel mode of operation. Kernel proxy agent 46 recognizes the mode change of processor, toggles control signal 50 and enables 44), wherein the kernel proxy agent comprises a software agent executing on the processor ([0032] mentions that software interrupt directs the processor core to change mode from user mode to kernel mode. Software interrupt causes software routines to be executed so that microprocessor can change mode and generate the control signals necessary for indicating mode change to 46. Therefore, there must be a software routine executed on the processor that is responsible for generation of control signals for 46. The software routine that drives 46 for enabling kernel mode memory and the logic 46 can be considered together as the kernel proxy agent. In that way, kernel proxy agent comprises a software component executing on the processor) **to provide access to processing system resources** (secure areas such as 44 is enabled during supervisor mode. Therefore, user can reach to the secure area. [0037]-[0039] discusses how secure areas are protected. User can access the secure areas but he cannot read the secure areas as data out 84 is blocked by control signal 86 and not available to output port TDO as shown in Fig 5A and 5B. Therefore, access to resource is permitted but reading is not permitted by the secure area obstruction circuit 82).

Although Dickerson does not mention about OS, processor typically use and execute OS for management purpose. Therefore, one ordinary skill in the art would be motivated to execute OS in the processor of Dickerson for better management.

About the limitation, "when the OS does not include an OS user mode application programming interface ("API") for interacting with the hardware device", user mode of processor of Dickerson can't access 44. Therefore, any OS operating on Dickerson's processor can't have user mode API to access 44. The only way to access 44 is through kernel proxy agent.

Although Dickerson provides secure area obstruction circuit to increase security, prior art system did not include any obstruction circuit and allowed the user in supervisor mode to read the secured area ([0033]). Therefore, one ordinary skill would be motivated to access and read the secure area, where security is not a concern, for example, when user is the supervisor. That way, the testing and debugging can be easier.

Dickerson et al do not explicitly mention that the emulated pre-boot environment executing during an operating system ("OS") runtime of the processing system. Linderman teaches a system where pre-boot application ("runtime open firmware") is executed within an emulated pre-boot environment ([0050] mentions that runtime open firmware is an instance of the boot code initializing the system. Therefore, runtime open

firmware is an emulated pre-boot environment during OS, since it is running during OS runtime and is a boot instance) during OS runtime and interacting with a hardware device in response to the executing of the pre-boot application ([0055]).

It would have been obvious for one ordinary skill in the art at the time the invention was made to combine the teachings of Dickerson and Linderman. One ordinary skill in the art would be motivated to emulate the pre-boot environment during OS runtime of the processing system since OS provides many functionality such as creating device tree.

For claims 2, 10, Dickerson does not explicitly mention about the reporting of error occurred during the interaction with the hardware device. Examiner takes an official notice that reporting error is well known in the art. One ordinary skill in the art would be motivated to have an error reporting when interacting with hardware, since ICE is a debug tool for the firmware. If there is any error occurred in accessing the supervisor memory, such error reporting would help the user to take further proper action.

For claim 3, interface translator is the element that changes the mode of the processor from user mode to kernel or supervisor mode in Dickerson. If the pre-boot environment is emulated during OS runtime, the modes can be integrated with OS through OS API. OS can pass the request for hardware interaction from firmware to the OS API if API is available (for example, accessing user mode memory). If OS API is not available (for

example, when accessing supervisor mode memory), interface translator changes the mode from user to kernel to access the supervisor mode components.

For claim 4, software input by the user in Dickerson is the interface that enables interface translator (or, mode change). In such a case, software input is part of kernel proxy agent.

For claim 5, kernel mode has to reserve memory controller to be used by the supervisor memory.

For claim 6, Linderman teaches add-in card and add-in slot.

For claim 7, Dickerson does not explicitly mention about copying the firmware to the option ROM after the functionality is determined to be correct. However, the system of Dickerson tests and develops the firmware, which means that the firmware would be saved to ROM when there would not be any error.

For claim 8, to access 44 of Dickerson in a pre-boot environment, a memory controller (i.e., the memory driver) needs to be accessed first.

For claim 9, Dickerson et al teach the following limitations:

A machine accessible medium that provides instructions that, if executed by a machine, will cause the machine to perform operations, comprising:

executing a pre-boot application ("firmware" mentioned in line 1 of [0028] of page 2) within an emulated pre-boot environment (10) to test functionality of the pre-boot application (lines 1-2 of [0028] of page 2), the emulated pre-boot environment executing within a user mode of a processor ([0040]) of a processing system; and interacting with a hardware device (44) of the processing system (Fig 1B) in response to the executing of the pre-boot application ([0032] of page 3) via a kernel proxy agent (46 is the kernel proxy agent, since it enables 44, which is only enabled in kernel mode) executing in a kernel mode of the processor (supervisor mode is the kernel mode. To access 44, processor 40 should be in kernel mode of operation. Kernel proxy agent 46 recognizes the mode change of processor, toggles control signal 50 and enables 44), wherein the kernel proxy agent comprises a software agent executing on the processor ([0032] mentions that software interrupt directs the processor core to change mode from user mode to kernel mode. Software interrupt causes software routines to be executed so that microprocessor can change mode and generate the control signals necessary for indicating mode change to 46. Therefore, there must be a software routine executed on the processor that is responsible for generation of control signals for 46. The software routine that drives 46 for enabling kernel mode memory and the logic 46 can be considered together as the kernel proxy agent. In that way, kernel proxy agent comprises a software component executing on the processor) **to provide access to processing system resources** (secure areas such as 44 is enabled during supervisor

mode. Therefore, user can reach to the secure area. [0037]-[0039] discusses how secure areas are protected. User can access the secure areas but he cannot read the secure areas as data out 84 is blocked by control signal 86 and not available to output port TDO as shown in Fig 5A and 5B. Therefore, access to resource is permitted but reading is not permitted by the secure area obstruction circuit 82).

Although Dickerson does not mention about OS, processor typically use and execute OS for management purpose. Therefore, one ordinary skill in the art would be motivated to execute OS in the processor of Dickerson for better management.

About the limitation, "when the OS does not include an OS user mode application programming interface ("API") for interacting with the hardware device", user mode of processor of Dickerson can't access 44. Therefore, any OS operating on Dickerson's processor can't have user mode API to access 44. The only way to access 44 is through kernel proxy agent.

Although Dickerson provides secure area obstruction circuit to increase security, prior art system did not include any obstruction circuit and allowed the user in supervisor mode to read the secured area ([0033]). Therefore, one ordinary skill would be motivated to access and read the secure area, where security is not a concern, for example, when user is the supervisor. That way, the testing and debugging can be easier.

Dickerson et al do not explicitly mention that the emulated pre-boot environment executing during an operating system ("OS") runtime of the processing system. Linderman teaches a system where pre-boot application ("runtime open firmware") is executed within an emulated pre-boot environment ([0050] mentions that runtime open firmware is an instance of the boot code initializing the system. Therefore, runtime open firmware is an emulated pre-boot environment during OS, since it is running during OS runtime and is a boot instance) during OS runtime and interacting with a hardware device in response to the executing of the pre-boot application ([0055]).

It would have been obvious for one ordinary skill in the art at the time the invention was made to combine the teachings of Dickerson and Linderman. One ordinary skill in the art would be motivated to emulate the pre-boot environment during OS runtime of the processing system since OS provides numerous functionalities such as creating device tree.

For claim 11, interface translator is the element that changes the mode of the processor from user mode to kernel or supervisor mode. If the pre-boot environment is emulated during OS runtime, the modes can be integrated with OS through OS API. OS passes the request for hardware interaction from firmware to the OS API if API is available (for example, accessing user mode memory). If OS API is not available (for example, when

accessing supervisor mode memory), it changes the mode from user to kernel to access the supervisor mode components.

For claim 12, software input by the user in Dickerson is the interface that enables interface translator (or, mode change). In such a case, software input is part of kernel proxy agent.

For claim 13, kernel mode has to reserve memory controller to be used by the supervisor memory.

For claim 14, Linderman teaches add-in card and PCI slot (170, 120).

For claim 18, Linderman teaches add-in card and add-in slot (170, 120). One ordinary skill in the art would be motivated to use PCI slot and PCI add-in card, since add-in card can be replaced and added easily on the system.

5. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dickerson et al (US Patent Application Publication 20030212897), in view of Linderman (US Patent Application Publication 20040215950), further in view of Mealey et al (US Patent 5958049).

For claim 15, neither Dickerson nor Linderman teaches that the proxy agent is installed during initialization of OS. Mealey et al teach a system where proxy agent (56) is loaded during OS initialization.

It would have been obvious for one ordinary skill in the art at the time the invention was made to combine Dickerson, Linderman and Mealey. One ordinary skill would be motivated to install during OS initialization so that the proxy agent does not need to be installed separately, which needs additional overhead.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 9, 16 are rejected under 35 U.S.C. 102(e) as being anticipated by Bonola (US Patent 5913058).

For claim 1, Bonola teaches the following limitations:

A method, comprising: executing a pre-boot application (loader program 32) **within an emulated pre-boot environment** (Fig 2) **to test functionality of the pre-boot**

application (lines 57-61 of column 7 mention that initialization of loader routine 32 is performed. The initialization performs testing of a program), **the emulated pre-boot environment executing within a user mode** (the real mode mentioned in 108 can be treated as user mode as it provides access to 1 MB memory, i.e, restricted access. There is no particular definition of user mode. Examiner is considering "real mode" as user mode as user can address 1 MB of memory) **of a processor** (12a) **of a processing system** (Fig 1) **during an operating system ("OS") runtime of the processing system** (102 mentions that the OS is loaded. Therefore, 108 executes during runtime of OS); **and interacting with a hardware device** (24; lines 5-10 of column 10) **of the processing system in response to the executing of the pre-boot application via a kernel proxy agent** (30) **executing in a kernel mode of the processor** (114 and 116; the protected mode is considered kernel mode as 4 GB of memory can be accessed and first processor can communicate with the kernel agent 32 as mentioned in lines 8-12 of column 10), **wherein the kernel proxy agent comprises a software agent** (30 is a software program) **executing on the processor** (lines 39-40 mention that first processor load 30. Therefore, 30 is executed on processor. Fig 3 shows the steps where 30 is executed on processor) **to provide access to processing system resources** (28; lines 8-12 of column 10).

Claim 9 disclose the medium and claim 16 discloses the system to perform the method of claim 1. Thus, the cited art teaches the limitations of claim 9 and claim 16.

Response to Arguments

Applicant's arguments filed on 1/4/2007 have been fully considered but they are not persuasive.

Applicant argues that Dickerson does not teach the limitations "to provide access to processing system resources".

Examiner disagrees. User can access the secure areas but he cannot read the secure areas as data out 84 is blocked by control signal 86 and not available to output port TDO as shown in Fig 5A and 5B. Therefore, access to resource is permitted but reading is not permitted by the secure area obstruction circuit 82. Although Dickerson provides secure area obstruction circuit to increase security, prior art system did not include any obstruction circuit and allowed the user in supervisor mode to read the secured area ([0033]). Therefore, one ordinary skill would be motivated to access and read the secure area, where security is not a concern, for example, when user is the supervisor. That way, the testing and debugging can be easier.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fahmida Rahman whose telephone number is 571-272-8159. The examiner can normally be reached on Monday through Friday 8:30 - 5:30. If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Rehana Perveen can be reached on 571-272-3676. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Fahmida Rahman
Examiner
Art Unit 2116

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THUAN N. DU
PRIMARY EXAMINER